K16U 2509

Reg. No. : ....

Name : ....

I Semester B.Sc. Degree (C.C.S.S. – Reg./Supple./Improv.) Examination, November 2016

COMPLEMENTARY COURSE IN PHYSICS

1C01 PHY : Mechanics

(2014 Admn. Onwards)

Time : 3 Hours   Total Marks : 32

Instruction : *Write answers only in English.*

SECTION – A

Answer **all** questions. Very short answer type, **each** question carries **1** mark.

1. If particles of the medium vibrate parallel to the direction of propagation of wave motion, it is a _____ wave.

2. The Young's modulus of a wire of length L and radius R is Y N/m². If length is reduced to L/2, and radius R/2, it's Young's modulus will be

3. Velocity of longitudinal wave in a gas depends up on elasticity and _____ of the medium.

4. The uncertainty relation hold for momentum and

5. The equation for torque is   **(5×1=5)**

SECTION – B

Answer **any four**. Short answer type, **each** question carries **2** marks.

6. What is poisson's ratio ? Give it's limiting values.

7. Using figure show angle of twist and angle of shear.

8. What do you mean by de Broglie wave ?

9. State and explain Parallel Axis Theorem.

10. Explain harmonic oscillation with example.

11. A particle executing S.H.M has amplitude 1 m and time period 2 s. Calculate the velocity when displacement being 0.5 m. **(4×2=8)**

SECTION – C

Answer **any three**. Short essay/problem type, **each** question carries **3** marks.

12. Derive an expression for work done in twisting a wire.

13. Derive expression for the energy of S.H.M. Plot the kinetic and potential energies as a function of displacement.

14. Show that a hollow shaft is better than a solid shaft of same length and same Material, for transmitting torque.

15. A gold wire 3.2×10^{-4} m in diameter elongates by 10^{-3} m when stretched by a force of 0.33 kg Wt. Find the Young's modulus of the material if the length of the wire is 0.6 meter.

16. Derive time independent schrodinger equation. **(3×3=9)**

SECTION – D

Answer **any two**. Long essay type, **each** question carries **5** marks.

17. Describe damped harmonic oscillator. Discuss different cases of damping.

18. Explain Transverse wave in stretched string and modes of transverse vibrations in a string.

19. With necessary theory explain torsional oscillation of a torsion pendulum and derive an expression for the rigidity modulus of a thin wire.

20. Explain about Davisson and Germer experiments. **(2×5=10)**

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